



Figure 4-76. Extremities carry.



Figure 4-77. Chair-litter carry.

4-52. Severe Injuries Carry

In cases of severe injuries the number of rescuers should be increased to at least three. This makes it **possible** to transport the victim with the least possible bending or twisting of his body.

a. To make the carry more effective, all efforts should be coordinated, and to do so, one of the group must be in command. **The** common practice is to make the one at the victim's head commander or leader of the crew. This applies especially to a three-man crew.

b. The three-man carry is accomplished as **fol-**lows: The three men line up on one side of the victim and the leader gives the word to "prepare to lift." Each man kneels on the knee nearest the victim's feet, with one man at his shoulders, one at his hips, and one at his knees. Without further orders, they pass their hands and forearms under the victim (A, fig. 4-78). The one at the head places his hands under the victim's neck and **shoulders**, the next places his hands under the pelvis and hips and small of the back, and the third under the knees and ankles. At the command "Lift," they raise the victim and place him on their knees, but without releasing their hands (**B**, fig. 4-78).

c. At the command "Prepare to raise," they slowly turn the victim on his side toward them until he rests in the bend of the elbows. At the command "Rise," all rise slowly to standing position, holding the patient closely against their chests (C, fig. 4-78). If space permits, the rescuers may move forward at the command "**March,**" starting off with the left foot. If space will not permit moving forward, they must move sidewise, in which case the command, "Side step left (or right)" is given. The rescuers step off with the foot according to the command, bring the other foot up to it in even, short steps. The victim is lowered and placed by reversing the operations, always at the command of the leader.

4-53. lowering and Raising a Victim

In situations where the victim is not at ground level and the natural exits are blocked, he must be rescued by some other means of escape. In fire rescues, this usually involves lowering the victim, although in rare cases it might involve raising him.

a. The escape method commonly used by the rescue squad of the fire service is by a ladder

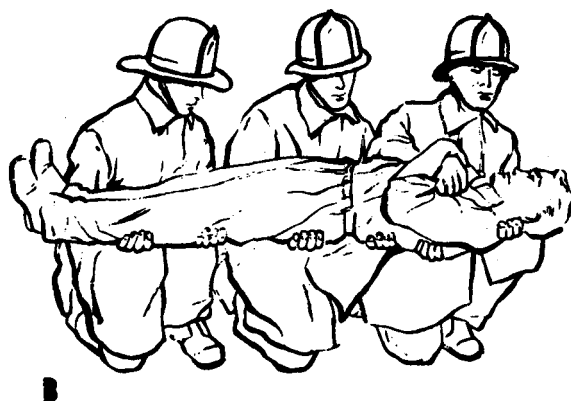
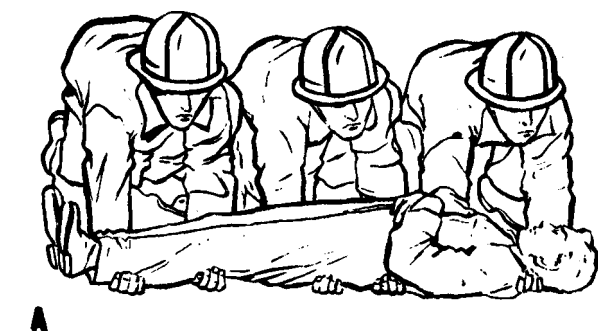


Figure 4-78. Severe injuries carry.

from the outside. If the victim is conscious and uninjured, he may be guided down a ladder at a window or other opening as shown in figure 4-79. Generally a victim is **unaccustomed** to going down a ladder, especially under emergency circumstances, so great care must be taken to make sure that he does not fall. The rescuer goes down below the victim, keeping his arms around him and one knee between the victim's legs to assure a support in case he becomes unconscious.



Figure 4-78. Lowering victim on ladder.

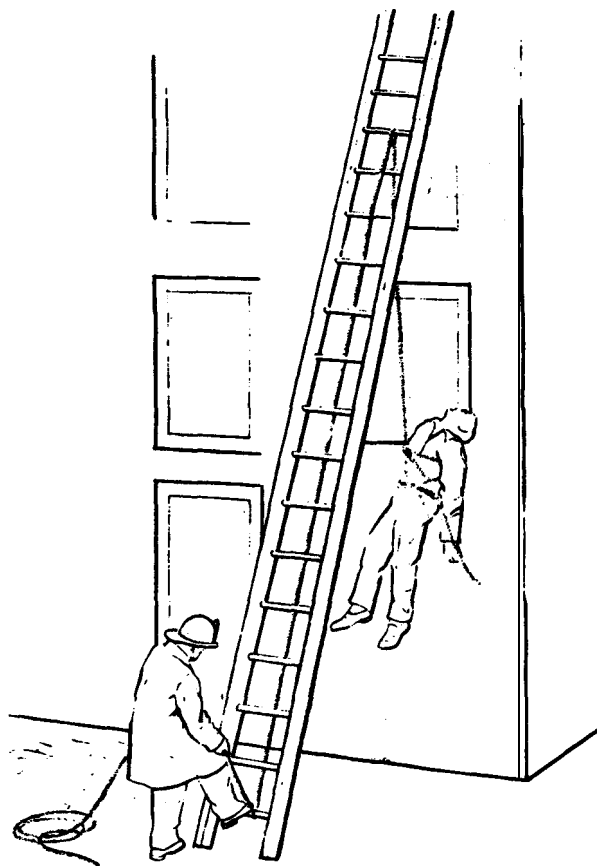


Figure 4-80. Lowering victim with rope and ladder.

b. Should the victim become unconscious, the rescuer lets him slip down astride his knee and proceeds carefully to the ground. If the victim is unconscious or not too seriously injured, he may be carried down the ladder by the pack-strap method.

c. An unconscious victim may be lowered from an upper floor by the use of a ladder and lifeline. (A small **handline** is not safe for this practice). Although it may appear slow compared to carrying him down a ladder, the method **may** be a safer one in certain conditions.

d. The procedure is as follows. A ladder is raised to a point just **above** the window where the rescue is to be made. The first man takes the end of the lifeline at the bottom of the ladder and passes it underneath the bottom rung. The end is

then held in either hand so that the rope will **feed** to the under side of the ladder as he ascends. When the bottom of the window sill is reached, the rope is then threaded back through the rungs, up **and over** three consecutive rungs. This allows the rope to hang freely but not too close to the building. Enough rope is then fed through, aided by the men on the ground, to allow a **sufficient** length to be taken through the window where the tie is made. Usually about 20 feet (6 meters) is enough for this operation. The rescuer then steps from his ladder through the window into the room and makes the tie on the victim. After the tie has been made, the victim is swung from the window and lowered by the men on the ground holding the rope tight (fig. 4-80).

Section VII. FIRST AID

4-54. Definition and Requirements

First aid is the immediate and temporary care given to casualties before they can be treated by professional medical personnel. The firefighter is confronted mainly with cases of bleeding, respiratory deficiencies, shock, fractures, burns, and wounds. In all cases, the **uninjured** must **be** assured of the competency of those **administering** first aid. The victim must be kept lying down and warm with a blanket under him (if possible without danger of injury), and as comfortable as possible.

4-55. Short Distance Transfer

If the victim must be moved to safety, he should be pulled in the direction of the long axis of his body, not sideways. The danger is less if a blanket or similar object can be placed beneath him **so** that he can be dragged with the blanket. If a person must be lifted to safety before a check for injuries can be made, the carriers **should** try **to** protect all parts of the body from the tensions of lifting, as discussed in paragraphs 4-47, and 4-52.

4-56. External Bleeding

Severe bleeding (hemorrhage) may cause **death** within minutes; therefore, it requires **immediate attention**. It causes shock, the degree of which depends on the severity of the injury and **on the** temperament of the injured. Most bleeding can be stopped by applying direct pressure over the wound. Some wounds may require pressure on the

vessel which supplies the blood to the part of the body that is injured.

a. **Direct Pressure.** Place an opened first-aid dressing over the wound and press down (fig. 4-81). The pressure compresses the blood vessels. This reduces the blood flow and it also helps to hold blood in the wound until it clots. An additional measure which aids in controlling bleeding from an arm or leg is to elevate the injured limb higher than the rest of the body.

CAUTION

If there is a suspected fracture of an arm or leg do not raise the injured limb until it has been properly splinted.

b. **Digital Pressure.** It may be necessary at times to apply pressure to the supplying blood vessel to reduce bleeding. If blood is spurting

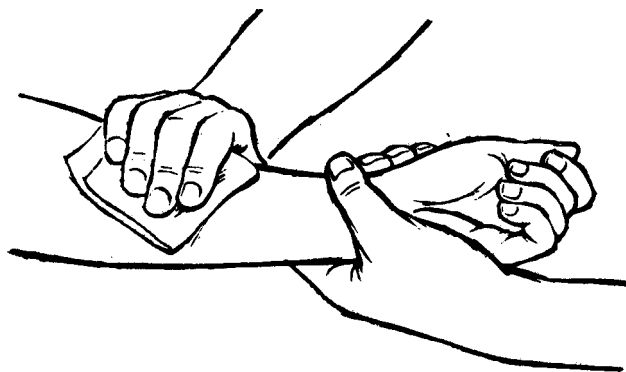


Figure 4-81. Stopping bleeding by direct pressure on the wound.

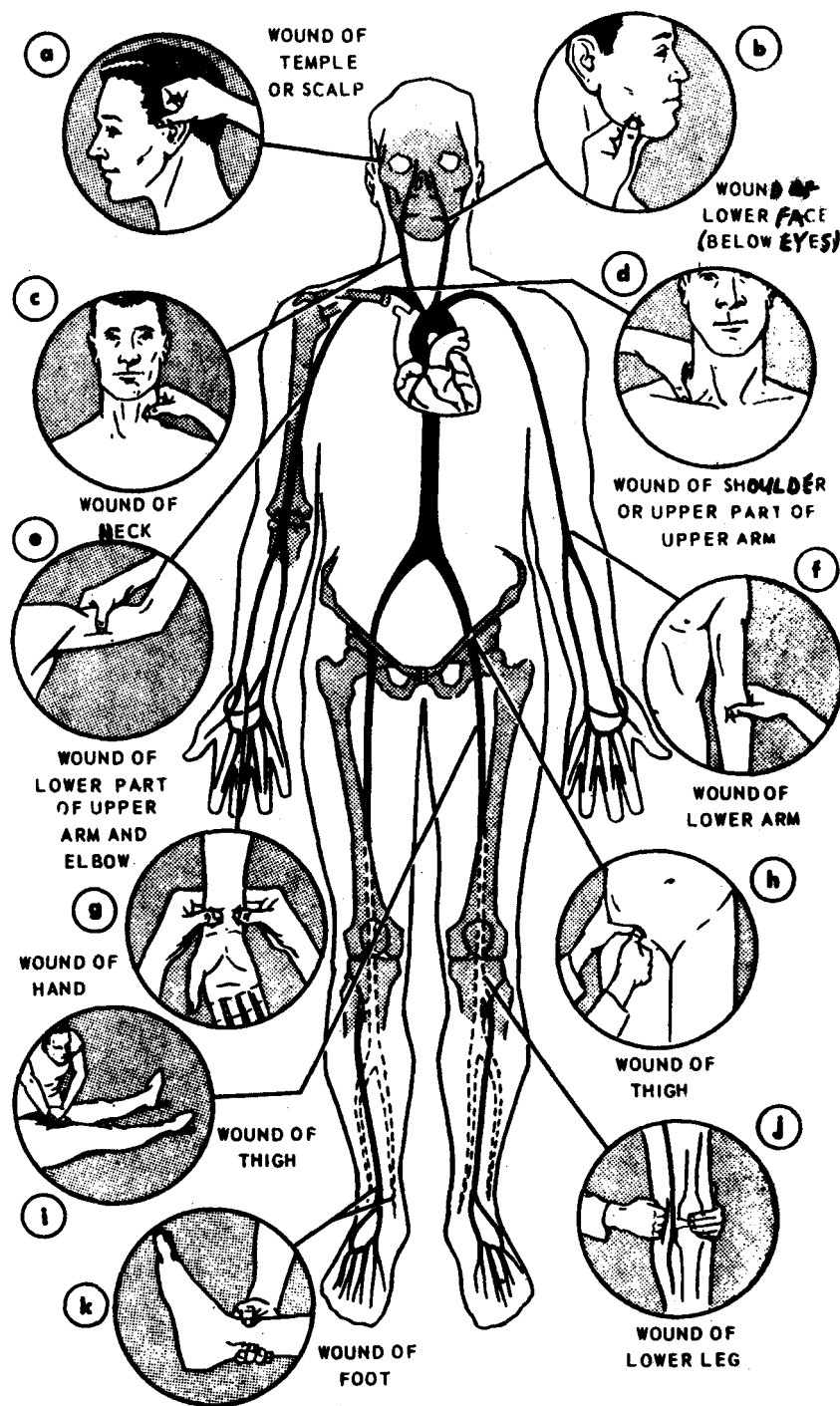


Figure 4-82. Pressure points from temporary control of arterial bleeding.

from a wound (arterial bleeding), digital pressure can be used to control the bleeding until a pressure dressing can be unwrapped and applied. Digital pressure is applied with the fingers, the thumbs, or the hands to a pressure point (fig. 4-82). A pressure point is the site at which a main artery supplying the wounded area lies near the skin and over a bone. By pressing on this point the flow of blood from the heart to the

wound is shut off or at least slowed down. The two most essential pressure points to know are *e* and *h* on figure 4-82. These are the main points by which bleeding from the extremities can be controlled.

c. Tourniquet. A tourniquet is a band placed around an arm or leg so tightly that the compression Hocks the arteries. It should be used *only* if pressure over the wound and elevation or pressure

on the supplying blood vessels fail to control the bleeding. A tourniquet does not stop all bleeding immediately. When a tourniquet is needed it must be applied promptly and properly.

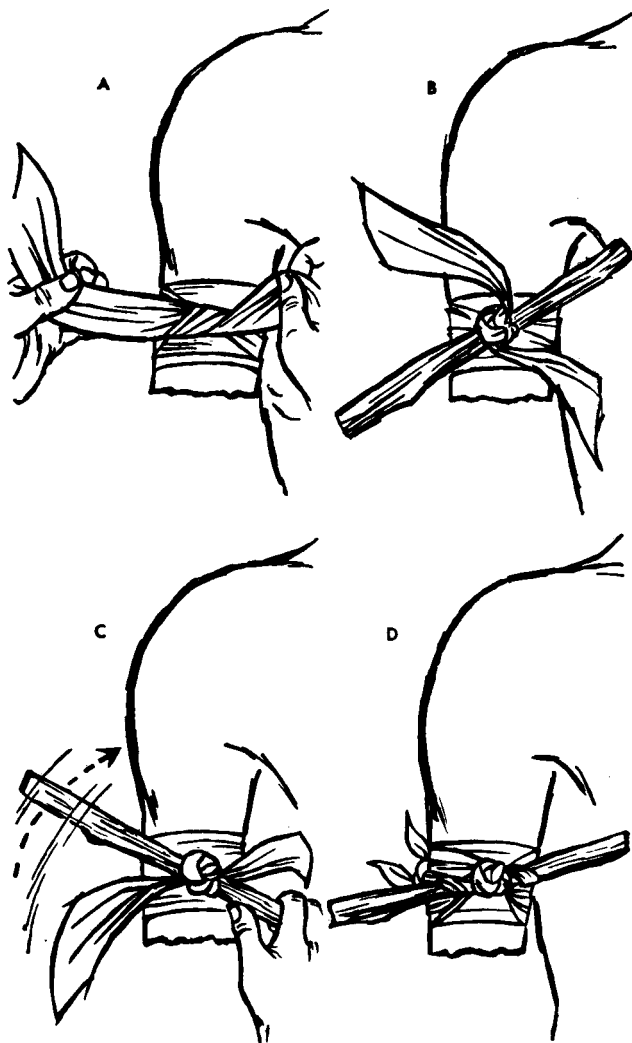
(1) If a regular issue tourniquet is used, the buckle should be adjusted as shown in figure 4-83, and the strap pulled downward while the injured part is steadied. If an issue tourniquet is not available, a belt, tie, rope, or handkerchief is used instead of the strap. These improvised bands are tied around the arm or leg and twisted with a stick as shown in figure 4-84. A tourniquet must be drawn up tightly.

(2) For bleeding from the arm or leg, never apply a tourniquet over a bony part such as wrist, elbow, ankle, or knee. It is more efficient when applied over fleshy parts such as the thigh or upper arm. The tourniquet should be applied as close as possible to the edge of the wound,

(3) Once the tourniquet has been **applied**, the wounded man should be seen by a doctor as soon **as** possible. The tourniquet should not be loosened by anyone except medical personnel. When a tourniquet has been applied to a casualty, the time of application should be written on or near the tourniquet.

4-57. Internal Bleeding

If the victim is bleeding from the mouth or nose, the blood is probably coming from the lungs, stomach, or within the skull, or passages related thereto. If the victim has trouble breathing, raise the head and shoulders, using pillows or substitutes. Try to control his vomiting. Give no stimulants or water. If unconscious, turn the victim on his side with head and chest lower than the hips. This prevents the victim from drawing blood into



- A. WRAP TWICE AROUND ARM, TIE HALF - KNOT.
- B. PLACE 'WINDLASS' OVER HALF KNOT.
- C. FINISH KNOT AND TURN WINDLASS TOTIGHTEN.
- D. SECURE WINDLASS WITH TAILS OF TOURNIQUET.

Figure 4-84. Application of an improvised tourniquet.

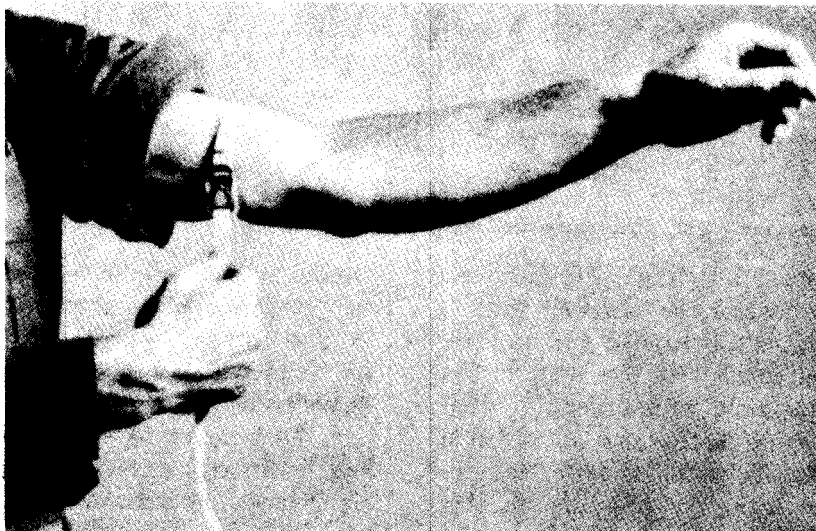


Figure 4-88. Application of a regular issue tourniquet.

the lungs while breathing. Obtain medical care **immediately**.

4-58. Artificial Respiration

a. Knowledge of artificial respiration is essential to firefighters. Large fires sometimes trap people in smokefilled buildings. Then, too, firefighters are themselves likely victims of smoke inhalation. Thus, it becomes the duty of firefighters to know and apply artificial respiration.

b. Artificial respiration is administered to **non-breathing** victims of electric shock, drowning, gas poisoning, poisoning by respiration-depressing drugs (**morphine**, opium, barbiturates, and **alcohol**), compression of the chest caused by building collapse or cave-ins, choking and strangling, and partial obstruction of the breathing passages. Artificial respiration must be started promptly after normal respiration ceases. Most persons die in approximately six minutes after breathing stops unless artificial respiration is administered.

c. Artificial respiration may be administered by manual or mechanical methods. When the manual method is necessary, it may be the **mouth-to-mouth** method, back-pressure arm lift method, or the back-pressure hip-lift method. In performing any method of artificial respiration, always keep the following general principles in mind.

(1) Time is of prime importance. Do not delay artificial respiration to loosen clothing, to warm the casualty, or to give stimulants. Most important is to get air into the casualty's lungs.

(2) Quickly sweep your **fingers** through the casualty's mouth to clear out froth and debris, and draw his tongue forward.

(3) Position the casualty properly in order to maintain an open airway. Tilt his head **as** far back as possible so that the front of the neck is stretched with the chin in a "jutting-out" position. Do not allow the chin to sag.

(4) Begin artificial respiration and continue it, without interruption, until the casualty starts natural breathing or is pronounced dead. A smooth rhythm is desirable, but split second timing is not essential.

(5) If the casualty begins to breathe on his own, adjust your timing to assist him. Do not fight his attempts to breathe. Synchronize your efforts with his.

(6) As soon as the casualty is breathing for himself, or when additional help becomes available, see that his clothing **is** loosened (or removed if wet) and that he is kept warm, and is being treated for shock.

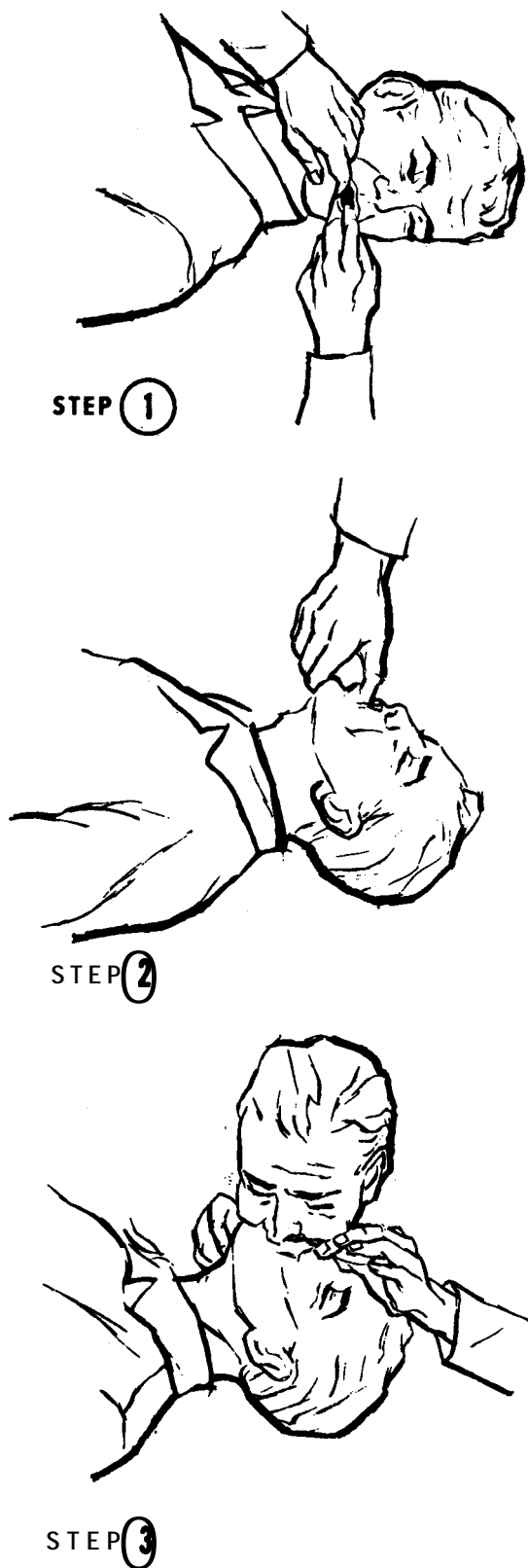


Figure 4-35. Mouth-to-mouth (thumb-jaw-lift) resuscitation method.

4-59. Mouth-to-Mouth (Thumb-Jaw-lift)**Method**

a. Place the casualty on his back (face up). **Do not** put anything under his head because it may flex the neck and **cause** the air passages to be blocked.

b. Quickly clear his mouth of any foreign matter by running your fingers behind his lower teeth **and** over the back of his tongue (fig. 4-85). Wipe out any fluid, vomitus, or mucus.

c. If available, place a rolled blanket or some other similar material under the shoulders so that the head will drop backward. Tilt his head back so that the neck is stretched and the head is in the “chin-up” position (fig. 4-85). This **aligns** the air passages so that they do not become blocked by kinking or pressure.

d. Place your thumb into the corner of his mouth and grasp the lower jaw firmly. Lift the lower jaw forward and pull the tongue forward out of the air passage. Do not attempt to hold the tongue. Close his nostrils with the thumb and index finger (step ③, fig. 4-85). Put a cloth over the victim’s mouth or nose and breathe through it if you do not wish to come in contact with the person.

e. Take a deep breath. Open your mouth wide. Then seal your mouth around the casualty’s mouth and your thumb, and blow forcefully (except for infants and small children) into his mouth until you see his chest rise. If the chest does not rise, hold the jaw up more forcefully and blow harder while making sure there is no blockage of the air passage and no air leakage around the mouth or nose.

f. When his chest rises, stop blowing and quickly remove your mouth from his. Take another deep breath while listening for his exhalation. (If his exhalation is noisy, elevate the jaw **further**.)

g. When exhalation is **finished**, blow in the next deep breath. The first **5** to 10 breaths must be kept (except for infants and small **children**) and given at a rapid rate in order to provide rapid reoxygenation. Thereafter, continue breathing at a rate of 12 to 20 times a minute until the casualty begins to breathe normally. Excessively deep and rapid breathing **may** cause you to become faint and even lose consciousness.

h. After performing rescue breathing for a time, you may notice that the casualty’s stomach is bulging. The bulging is due to air being blown

into the stomach instead of the lungs. Although an inflation of the **stomach** is not dangerous, it makes inflation of the lungs more difficult. Therefore, when you see the stomach bulging to a **marked** degree, apply gentle pressure to the stomach with your hand between inflations.

i. Remember: keep the air passages as clear of fluid and other obstructions as possible. Several sharp slaps between the shoulder blades usually dislodge foreign matter. Keep the head back, the neck stretched, and the chin pulled forward; readjust **position** if air does not flow freely in and out of casualty. Do not breathe too forcibly or too large a **volume** if casualty is an infant or small **child**; in infants seal both the mouth and the nose with your mouth and blow with small puffs of air from the cheeks, rather than blowing from the lungs. If **you** become distressed as a result of the shallow breaths, interrupt the blowing long enough to take a deep breath, then resume blowing.

4-60. Mouth-to-Mouth (Two-Hands-Jaw-lift)**Method**

This is an alternate method for use in a clean atmosphere when the casualty’s jaws are so tightly closed that the thumb cannot be inserted.

a. Place the casualty on his back, clear his mouth if possible, and position his head in the “chin-up” position.

b. Grasp the angles of his lower jaw with both hands just **below** the ear lobes and lift the jaw forcibly forward to pull the tongue forward out of the air passage. If the lips are closed, push the lower lip toward the chin with **your** thumbs (fig. 4-86).

c. Take a deep breath and open your mouth wide. Seal your mouth around the casualty’s mouth, press **your** cheek against his nose to prevent air leakage and blow forcibly into his mouth until you see his chest rise.

4-61. Mouth-to-Nose Method

This is an alternate method for use in a clean atmosphere when neither of the methods above can be used; for example, on casualties with severe jaw spasm or with wounds of the jaw and **mouth**.

a. Place the casualty on his back, clear his mouth if possible, and position his head in the “chin-up” position. Grasp the angle of his lower

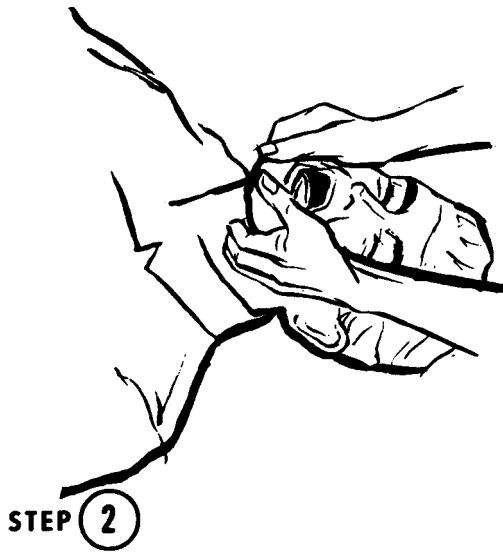
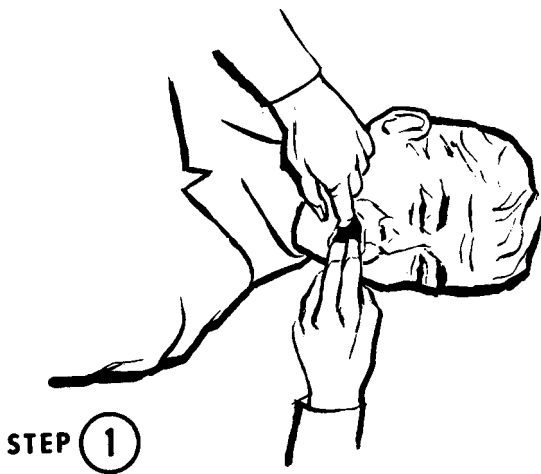


Figure 4-86. Mouth-to-mouth (two-hands-jaw-lift) resuscitation method.

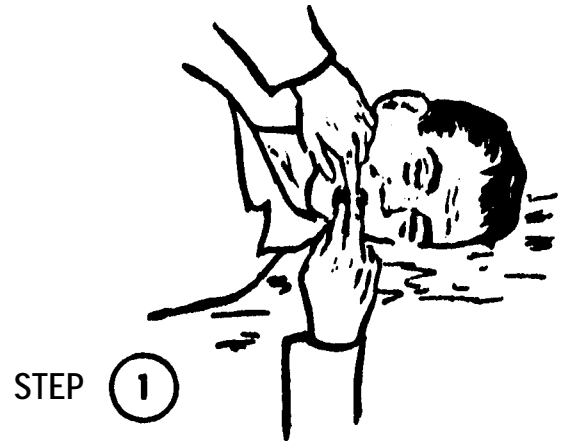


Figure 4-87. Mouth-to-nose resuscitation method.

jaw with one hand just below the ear lobe and lift the jaw forcibly forward (fig. 4-87).

b. Seal your other hand over the casualty's mouth to prevent air leakage (fig. 4-87).

c. Take a deep breath and open your mouth wide. Seal your mouth around the casualty's nose (fig. 4-87), and blow forcefully until you see his chest rise.

d. When his chest rises, stop blowing and quickly remove your mouth from his nose. Take another breath while listening for his exhalation.

4-62. Chest-Pressure Arm-lift Method (Modified Silvester)

This is the preferred method for use in a contaminated atmosphere.

a. Place the casualty on his back (face up) with his arms folded on his chest (fig. 4-88).

b. Quickly clear his mouth of any foreign matter by running your fingers behind his lower teeth and over the back of his tongue. Wipe out any fluid, **vomitus**, or mucus. If you are in a contaminated area and the casualty is not already masked, put his mask on. If he is already masked, quickly remove the mask, wipe away any fluids that may have collected in his mouth or in his mask, and replace the mask.

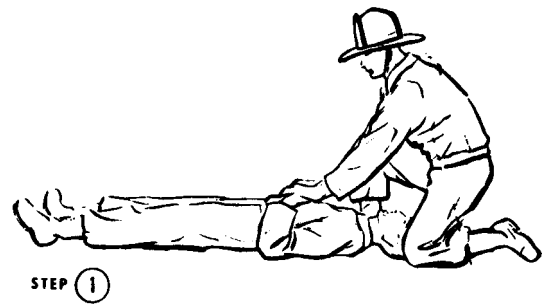
c. If available, place a rolled blanket or some other similar material under the shoulders so that the head will drop backward. Tilt his head back so that the neck is stretched and the head is in the "chin-up" position. If possible, keep the head in this position, since this **aligns** the air passages so that they do not become blocked by kinking or pressure.

d. Kneel on either knee at the casualty's head, placing your knee at one side of his head, and placing your opposite foot on the other side of his head.

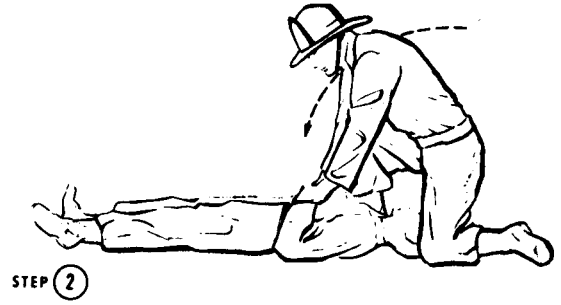
e. Take the casualty's arms just above his wrists and place them over the lower ribs. Rock forward and exert steady, uniform pressure almost directly downward until you meet firm resistance. This pressure forces air out of the lungs.

f. Immediately release this pressure and pull the arms outward and upward over his head and backward as far as possible (③, fig. 4-88). Lifting and stretching of the arms increases the chest size and draws air into the lungs.

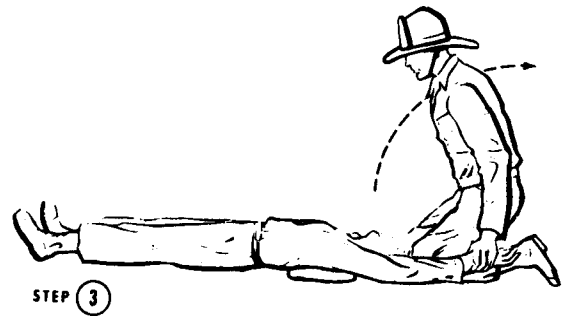
g. Slowly replace his arms on his chest and



STEP ①



STEP ②



STEP ③

Figure 4-88. Chest-pressure arm-lift resuscitation method

repeat the complete cycle about 12 times per minute at a rhythm of (1) **press**—(2) **lift**—(3) **stretch**—(4) **release**. The "release" should be abrupt.

h. If you become tired or uncomfortable on one knee, you may quickly switch to the other knee. If it is more comfortable, you may kneel on both knees, although the forward and backward motion is easier to obtain while kneeling on one knee only.

i. Check the mouth frequently for obstructions. If **vomitus**, mucus, or blood obstruct the air passage, keep the victim's head extended and turned to one side.

j. When a second man is available, he may take over the chest-pressure arm-lift with practically no break in the rhythm. This is done by the first man moving off to one side while the replacement

comes in from the other side. When the second man is ready, the casualty's arms are released during the "stretch" and the new operator takes them and continues in the same rhythm.

4-63. Followup Care in Artificial Respiration

When the casualty is breathing normally, wrap him in a blanket. He should remain lying down until he is seen by a physician or his recovery seems assured. When he is conscious, give him a warm drink, such as coffee or tea.

4-64. Shock

Although there are several types of shock, the one with which the firefighter is chiefly concerned is traumatic shock. This is a depressed condition of many of the body functions. It is caused by failure of enough blood to circulate through the body following a serious injury. Traumatic shock may result from injury to body tissues from burns, wounds, or fractures. In most instances it is the result of the loss of large quantities of blood either externally or into the tissues of body cavities. In general, the greater the damage to flesh and bone and the more loss of blood, the greater the danger that shock will occur. Victims of shock must be handled with great care; rough handling may have fatal results. Any seriously injured victim is susceptible to shock and must be handled accordingly.

a. *Symptoms of Shock.* The most important evidence of shock is the victim's weakness coupled with pale skin which is moist and cooler than normal.

(1) Beads of perspiration may be noted about the victim's lips, forehead, palms, and armpits. He may vomit or complain of nausea. His mental reactions may appear normal at first, but he will later lose his alertness and interest in his surroundings. He will most likely be thirsty.

(2) The pulse of a shock victim is rapid but may be weak and difficult to detect. Breathing is faster than usual with occasional deep breaths. In case of severe hemorrhage, these signs may not be evident at first but may develop after an hour or more. *Where there is doubt, give first-aid treatment for shock.*

b. *Treatment.* The same first-aid treatment should be used for both prevention and care of shock.

(1) Keep the victim lying down. This permits a greater amount of blood to flow to the head and

chest. It is also the most favorable position if there is injury to the internal organs or the head, or when there is evidence of fracture. If the victim has difficulty in breathing, his head and shoulders should be elevated. If there is no difficulty in breathing and there are no head injuries, the lower part of his body should be elevated to aid the flow of blood to the head and chest.

(2) Place a blanket beneath the victim and if necessary cover him with another. Keep him warm but just warm enough to be comfortable. Never use hot-water bottles or heating pads except in very cold weather, and then with care.

(3) The overall principle of applying heat to a shock victim is: do not add heat; simply prevent the loss of body heat.

(4) If the victim is conscious and there is no sign of nausea or stomach hemorrhage, a few sips of water may be given to him. If there is a delay in obtaining medical service, $\frac{1}{2}$ glass of water (with $\frac{1}{2}$ teaspoon of table salt and $\frac{1}{2}$ teaspoon of baking soda per quart (0.946 liter) of water), given at X-minute interval, is recommended when fluids may be given. Stimulants, such as ammonia or coffee, have no value in treating traumatic shock.

(5) Do not forget to give attention to the injuries of a shock victim. Also comfort and encourage him.

4-65. Electric Shock

a. Electric shock accidents frequently result from contact with a "live" wire and occasionally occur when a person is struck by lightning.

b. If a person has come in contact with an electric current, turn off the switch if it is nearby, but do not waste time looking for it. Use a dry wooden pole, dry clothing, dry rope, or some other material which will not conduct electricity to remove the person from a live wire (fig. 4-89). Do not touch the wire or the casualty with your bare hands.

c. Electric shock causes breathing to stop, so start artificial respiration immediately after freeing the person from the wire.

4-66. Fractures

Fractures (broken bones) are either simple or compound fractures (fig. 4-90). A simple fracture is also called a closed fracture because the broken bone has not pierced the skin and is causing no

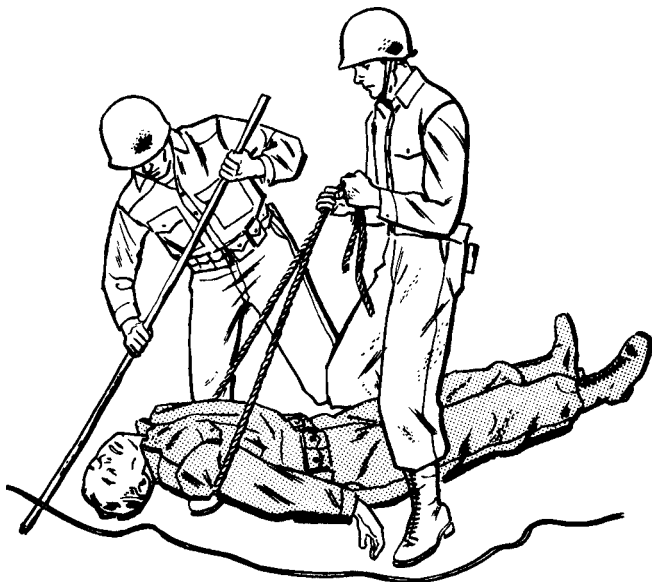


Figure 4-89. Rescuing an electric shock victim.

external bleeding. A compound fracture, sometimes referred to as an open fracture, is a broken bone that has pierced the skin.

a. *Signs and Symptoms of a Fracture.* The following are indications that a bone is broken :

- (1) Tenderness over the injury with pain on movement.
- (2) Inability to move the injured part.
- (3) Unnatural shape (deformity).
- (4) Swelling and discoloration.

b. *Treatment.* If you think a person has a broken bone, handle him with great care. Rough or careless handling causes pain and increases the chances of shock. Furthermore, the broken ends of the bone are razor-sharp and can cut through muscle, blood vessels, nerves, and skin. Remember -do not move a casualty with a fracture unless it is necessary. If you do, be gentle and keep the fractured part from moving. If there is a wound with a fracture, apply a dressing as you would for any other wound. If there is bleeding, use the first aid methods for stopping bleeding.

c. *Splinting.* All fractures require splinting. Persons with fractures of long bones or of the bones of the pelvis, back, and neck, should be splinted "where they lie" before any movement or transportation is attempted. Proper splinting greatly relieves the pain of a fracture and often prevents or lessens shock. Fixing the fragments of a broken bone by use of splints prevents the jagged edges of the bone from tearing blood vessels and nerves. Proper splinting of a closed frac-



SIMPLE FRACTURE



COMPOUND FRACTURE

Figure 4-90. Fractures.

ture will prevent the bone from piercing the skin and causing the fracture to be an open one. Proper splinting of an open fracture will prevent further injury to the wound. First aid in the field may require that you improvise splints from whatever material you may have handy-tree limbs, poles, rifles, cardboard, rolled newspapers or magazines, etc. You should remember that splints should always be padded, especially where they come into contact with bony parts, such as the elbow, wrist, knee, and ankle joints. Leafy vegetation can be used to supplement pieces of clothing used for splint padding.

(1) *Splints for fractured bones of the leg, thigh, and hip.* To splint a fractured leg, roll sticks or other support into a folded blanket, or other padding material, to form a padded trough in which to rest the injured leg (fig. 4-91). Bind the splints firmly at several places above and below the break. Splints for a leg fracture should extend from a point above the knee to a little below the foot (fig. 4-91). In case of a fractured

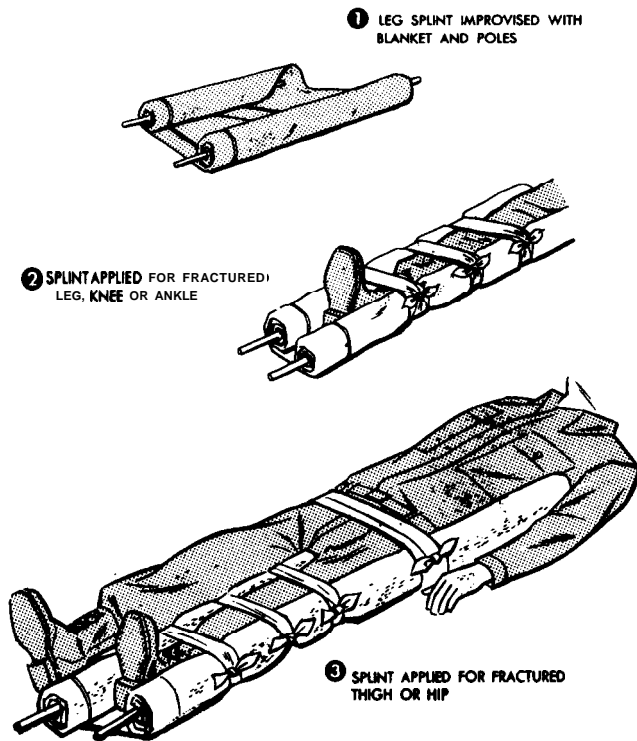


Figure 4-91. Improvised leg, thigh, hip splints.

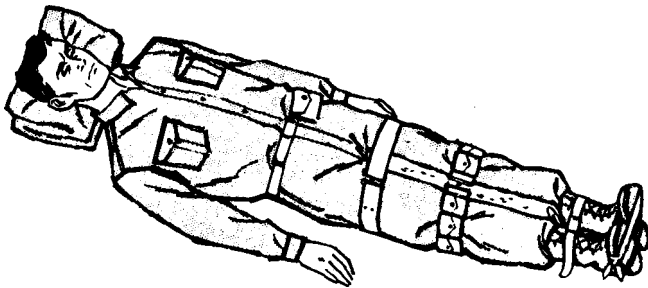


Figure 4-92. Expedient leg splint.

thigh or hip, poles and blankets may be used for splints as for the leg, except that the inside splint is extended from the crotch to a little below the foot. The outside splint is extended from the armpit to a little below the foot. The armpits and the crotch must be well padded. A quick way to splint a broken leg is to tie it to the casualty's uninjured leg (fig. 4-92). Padding is placed between the person's legs, then the legs are tied together at several points above and below the fracture. The casualty's feet with shoes on should be tied across the arches and toes.

(2) **Splints for fractured bones of the arm.** Keep a fractured bone of the arm from moving by supporting it with splints. This reduces pain and

prevents damage to the tissues. Temporary splints can be made from boards, branches, folded cardboard, magazines, newspapers, etc. A good general rule to remember in splinting any long bone (bones of the leg, thigh, forearm, or upper arm) is to have the splint long enough to extend from above the joint above the fracture to below the joint below the fracture. Splints should always be padded with some soft material to protect the limb from pressure and rubbing. Bind splints securely at several points above and below the fracture, but not tight enough to interfere with the flow of blood. It is well to apply two splints—one on either side of the arm. If an injured elbow is bent, do not try to straighten it; if it is straight, do not try to bend it. Figure 4-93 shows examples of splints correctly applied to the forearm, upper arm, and elbow to support the fractured bone and to prevent its moving. In figure 4-93, padding of splints has been omitted for clarity. A sling is the quickest way to support a fractured bone of the arm or shoulder, a sprained arm, or an arm with a painful injury. The arm should be bound snugly to the body to prevent movement. You can make a sling by using any material that will support all or a portion of the lower arm and hold it close to the body (fig. 4-94).

d. Broken Back. It is often impossible to determine whether a casualty has a broken back. Be suspicious of any back injury, especially if the back has been sharply struck or bent, or if the casualty has fallen. If a casualty has received such an injury and he lacks feeling in his legs or lacks the ability to move them, you can be reasonably sure that he has a severe back injury which should be treated as a fracture. You must remember that if there is a fracture, the sharp bone fragments can cut or damage the spinal cord and cause permanent paralysis (fig. 4-95).

(1) **Procedure for handling a spine-fracture casualty.**

(a) Place a low roll, such as a bath towel or clothing, under the middle of the back to support it.

(b) Lift the casualty, if he must be moved, onto a litter or board without bending his spine forward. It is best to have at least four men for this job (fig. 4-96).

(c) If the casualty is in a face-down position, he may be carried face down on a litter.

(d) Keep the casualty's body alignment straight and natural at all times and keep the air

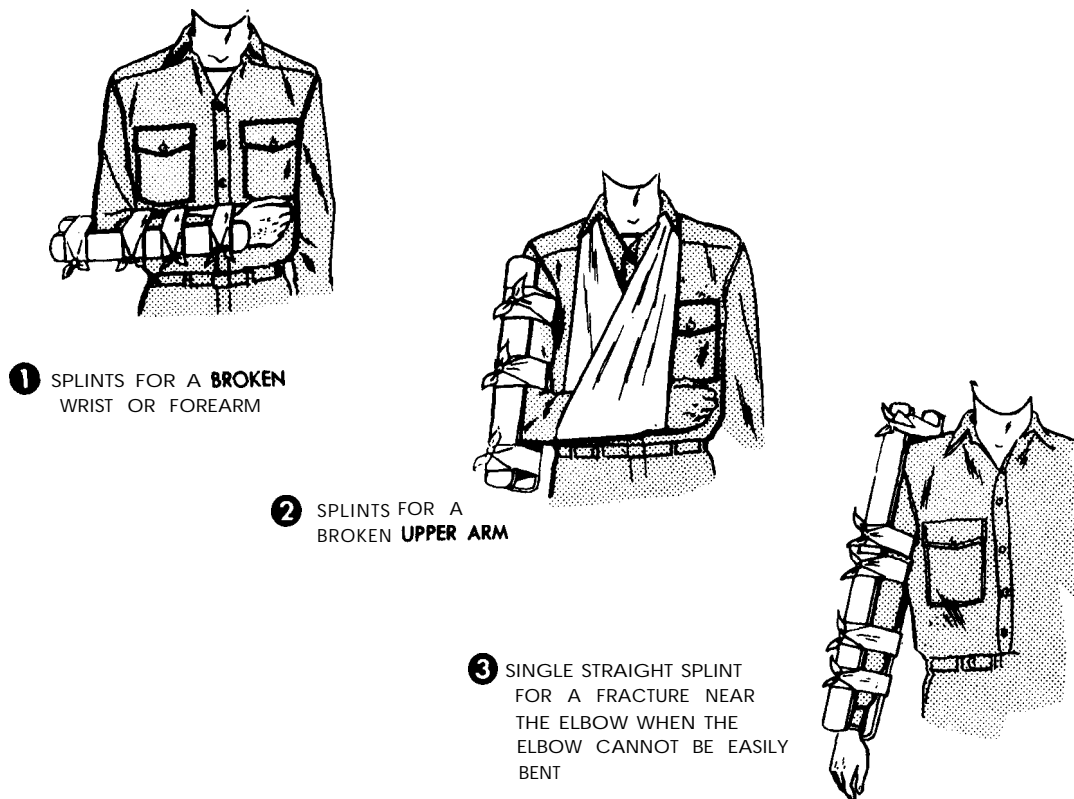


Figure 4-93. Splints for a broken arm.

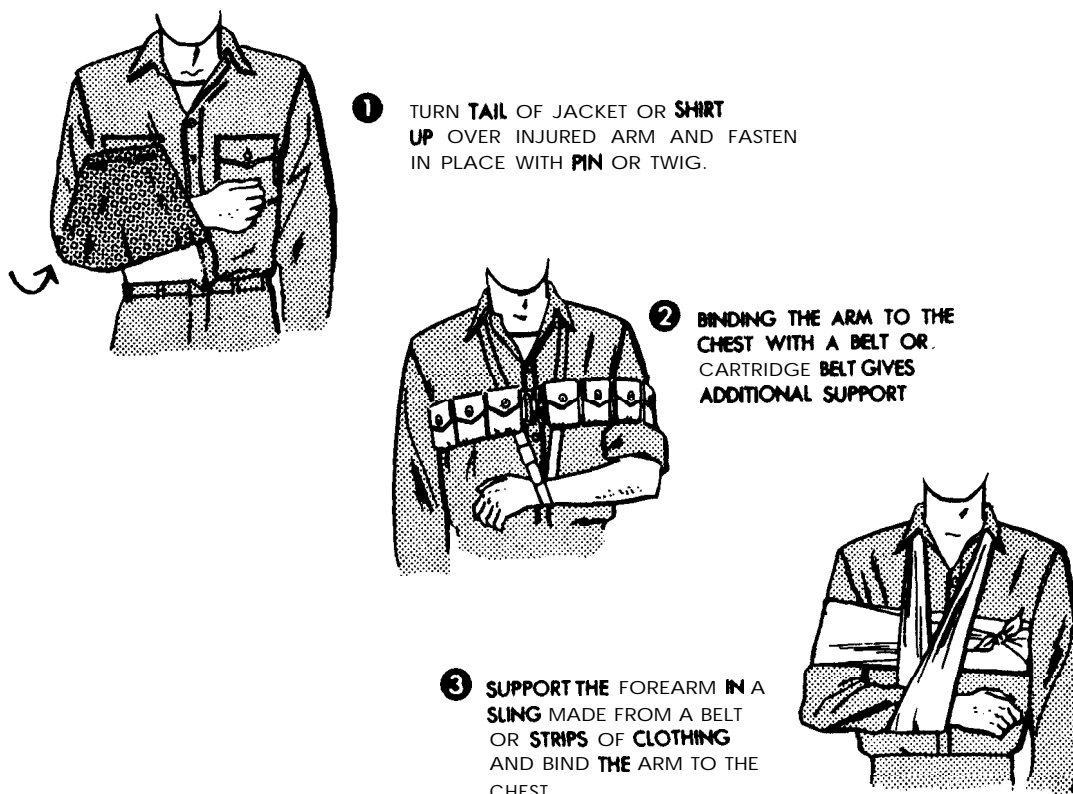


Figure 4-94. Slings for an injured arm.



1 IN THIS POSITION, BONE FRAGMENTS CUT THE SPINAL CORD



2 IN THIS POSITION, BONE FRAGMENTS ARE IN PROPER PLACE AND WON'T CUT THE SPINAL CORD

Figure 4-95. Positioning a broken back.



Figure 4-96. Four-man carry.

passages free. If he is conscious, caution him not to move.

(2) Cautions. Do not-

- (a) Move the casualty with a broken spine unless absolutely necessary.
- (b) Raise his head even for a drink of water.
- (c) Twist his neck or back.
- (d) Carry him in a blanket face up (fig. 4-96).

e. Broken Neck. A broken neck is extremely dangerous. Bone fragments may cut the spinal

cord just as in the case of a broken back. **Keep the casualty's head straight and still with the neck slightly arched.** If he is conscious, caution him not to move. **Moving him may cause his death.**

(1) A broken neck is protected as follows :

(a) Place a rolled bath towel, or a roll of clothing about the same bulk as a bath towel, under the neck for support and padding. The roll should be thick enough only to arch the neck slightly (fig. 4-97).

(b) Raise the shoulders in order to place the roll under the neck. Do not bend the neck or head forward. Do not twist or raise the head at all.

(c) Place the roll so that when the casualty is lying flat, the back of his head touches the ground.

(d) To keep the head motionless after the roll is in place, put a large padded rock or pack at each side of the head (fig. 4-97).

(2) If the man must be moved, get help. One person should support the man's head and keep it straight while others lift him. Transport him on a hard stretcher or board.

(3) Never turn over a casualty who has a broken neck.

f. Fractured Ribs. Fractured ribs cannot be splinted, but the pain can be relieved by restricting the movement of injured ribs. This is done by binding a tight swathe of muslin bandage around

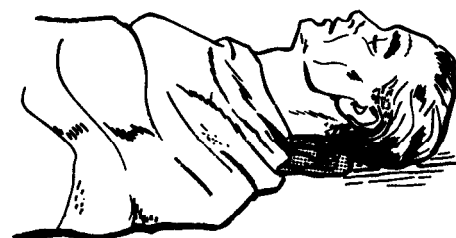


Figure 4-97. Protecting a broken neck.